WRAP THOR

ASCII INTERFACE USER'S MANUAL

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1 INTRODUCTION

WRAP THOR ASCII Command Interface is a software which allows easy access to Bluetooth functionality. It makes the radio interface totally transparent and host system can control connections with simple ASCII commands strings.

This makes the transition to wireless world easy as no specific Bluetooth know-how has to be obtained.

2 INSTALLATION

NOTE! In Evaluation Kit firmware is preinstalled.

ASCII Interface firmware should be installed with BlueFlash to WRAP THOR module. Steps are given below:

1. Start BlueFlash
2. Stop Processor
3. Choose File -> vm_serial_bt.xdv
4. Download

3 CONFIGURATION

NOTE! In Evaluation Kit these are already set as 115200,8,N,1.

Using PSTool the module should be configured to match the baud rate, stop bits and other UART configurations of the host system. Typical configuration for 115200kbit/s, 8 data bits, 1 stop bits, no parity can be done by setting the following values:

Table 1: PSTool Values

PSKey	Value
UART Config	168
UART Baudrate	115200
Host Interface	vm access to uart
HQ Active	False
VM disable	False
Deep sleep state configuration	Deep sleep will not be used

4 MODES

The device can operate in two modes, the modes and transitions are given in Table 2 and Figure 1.

Table 2: ASCII Interface Modes

Mode	Transition-to	Requirements for transition to other mode	Description of mode
Command Mode (initial state)	Data Mode	Successful call or incoming call will change the mode to data mode	In this mode the device can be commanded to perform various actions (See Chapter 4) such as inquiries etc...
Command Mode (Data mode visited)	Data Mode	Been in Data mode already, link is open and used +++ to get to command mode. Then 1s idle and +++ and 1s idle will change back to data mode.	This mode is used when Bluetooth link is open and some Bluetooth related action (like inquiry) has to be taken instead of just sending data.
Data Mode	Command Mode	At least 1s idle and three consecutive + characters and then at least 1s idle will change the mode to command mode. (Ie. <1+ s idle> +++ <1s idle>)	In this mode all data is sent totally transparently from RS-232 over the Bluetooth RFCOMM link to other device

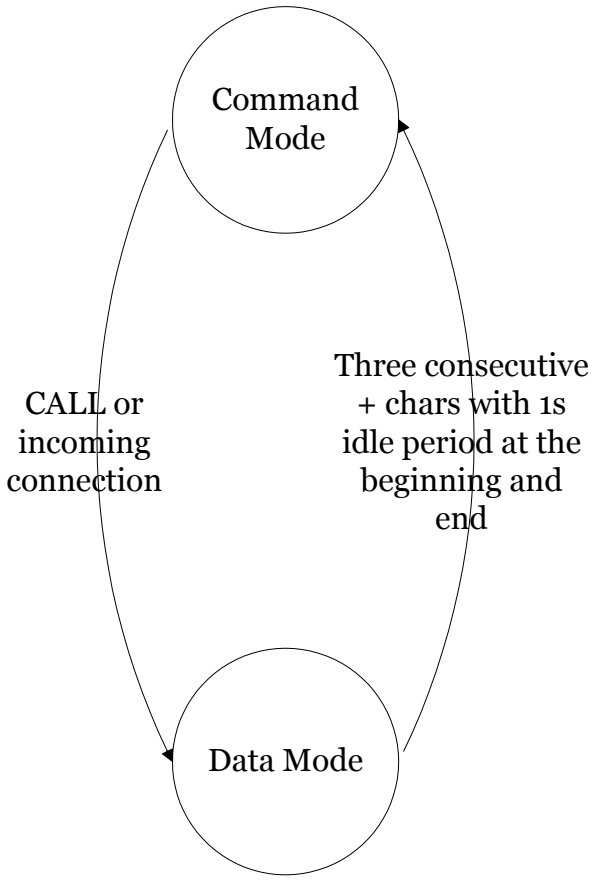
Command Mode
CALL or incoming connection
Three consecutive + chars with 1s idle period at the beginning and end
Data Mode

Figure 1: State Transitions

5 USAGE

ASCII Command Interface can be used from the HOST system by sending ASCII commands through UART. These commands should end with linefeed '\n' character.

When installed and configured the module can be commanded from the host with the following commands:

Table 3: ASCII Commands

Command and parameters	Meaning

`INQUIRY [time]`	Device starts an inquiry for [time] seconds and returns all discovered devices in a following form (first devices as per found basis and finally all in a list):
	`INQUIRY [BD_ADDR] [class_of_device]`
	Example:
	`INQUIRY 5`
	`INQUIRY_PARTIAL 00:07:80:80:00:ae 12010c`
	`INQUIRY_PARTIAL 00:07:80:80:00:1f 12010c`
	`INQUIRY_PARTIAL 00:02:34:12:03:12 12010c`
	`INQUIRY 3 (=number of devices found)`
	`INQUIRY 00:07:80:80:00:ae 12010c`
	`INQUIRY 00:07:80:80:00:1f 12010c`
	`INQUIRY 00:02:34:12:03:12 12010c`

`INQUIRY [time] NAME`	Same as above but gives also the names in the INQUIRY_PARTIAL messages.
	Example:
	`INQUIRY 5 NAME`
	`INQUIRY_PARTIAL 00:07:80:80:00:ae 12010c Tom`
	`INQUIRY_PARTIAL 00:07:80:80:00:1f 12010c HandyA`
	`INQUIRY_PARTIAL 00:02:34:12:03:12 12010c Phaser`
	`INQUIRY 3 (=number of devices found)`
	`INQUIRY 00:07:80:80:00:ae 12010c`
	`INQUIRY 00:07:80:80:00:1f 12010c`
	`INQUIRY 00:02:34:12:03:12 12010c`

`CALL [BD_ADDR]`	Device calls the device with BD_ADDR for [uuid] connection.

`[uuid] RFCOMM`	Returns:
	`CALL [link_id]`
	`CONNECT [link_id] RFCOMM 0`
	NOTE: After successful call, the device goes to data mode
	The supported uuids are: (Note that these have to be given without the 0x- prefix!)
	`Serial Port Connection 0x1101`
	`Object Push 0x1105`
	`(not supported in version 1.0)`
	`Object File Transfer 0x1106`
	`(not supported in version 1.0)`
	Example for Serial Port Profile connection to machine 00:07:80:80:00:79
	`call 00:07:80:80:00:79 1101 rfcomm`

`SET BT AUTH * [pin]`	Sets the default personal identification code (PIN) used for the Bluetooth connections.
`SET`	Shows the settings.
`HELP`	Prints the available commands.

`LIST`	Prints the connection information
	LIST [number_of_connections]
	LIST link_id$_1$ status type blocksize bytes_in bytes_out elapsed_time our_msc remote_msc bdaddr channel direction
	LIST link_id$_2$ status type blocksize bytes_in bytes_out elapsed_time our_msc remote_msc bdaddr channel direction
	...
	LIST link_id$_n$ status type blocksize bytes_in bytes_out elapsed_time our_msc remote_msc bdaddr channel direction
	`LIST 1`
	`LIST 0 CONNECTED RFCOMM 666 4242 100 30 8d 8d 00:11:22:33:44:55 4 OUTGOING`
	Status values are: `WAITING, CONNECTED`, and `CLOSING`.
	Type is always `RFCOMM`.
	Blocksize is the maximum transfer unit of the Bluetooth link,

	only for statistics. Bytes_in and bytes_out are numbers of bytes transferred. Elapsed_time is the number of seconds the connection has been up. Msc is the link's MSC value for both ends. Bdaddr is the Bluetooth address of the connected device. Channel is the service channel of the connection. Direction is either OUTGOING or INCOMING.
`CLOSE [link_id]`	Closes the given connection identified by link_id

Below are the events that the ASCII Command Interface can return when on Command Mode.

Table 4: ASCII Command Interface Events

Event and parameters	Meaning
`RING [BD_ADDR]`	Device with Bluetooth address of BD_ADDR called us for RFCOMM.
`SYNTAX ERROR`	Unknown command
`NO CARRIER [link_id] ERROR [Num][ErrStr]`	Link is closed identified by handle. Possible error is also given. Errors are described in Table Table 5.

Table 5: Error Messages

Error Messages	Meaning
`NO CARRIER [link_id] ERROR 1`	Timeout
`NO CARRIER [link_id] ERROR 3`	Disconnect, normal link shutdown
`NO CARRIER [link_id] ERROR 4`	Abnormal disconnect
`NO CARRIER [link_id] ERROR 5`	Remote refusal
`NO CARRIER [link_id] ERROR 6`	Service not supported
`NO CARRIER [link_id] ERROR 7`	Connect failed
`NO CARRIER [link_id] ERROR 1,3,4,5,6,7 CONNECT_ERR`	Same as above but when establishing Bluetooth link
`NO CARRIER [link_id] ERROR 0 NO_LINK`	"CLOSE" issued when no Bluetooth link established
`NO CARRIER [link_id] ERROR 1 PAIR_ERR`	Timeout when pairing
`NO CARRIER [link_id] ERROR 3 PAIR_ERR`	Pairing failed

5.1 PIN CODE

Initially the PIN code is set as empty. Use `set bt auth *` -command to set it.

5.2 CHANGING UART SETTINGS WITH BLUESUITE

If you want to change settings of the UART do as follows:

1) Type "BGT REBOOT_FOR_DFU" in the ASCII Interface
2) Close Terminal software
3) Start PSTool software from the BlueSuite
4) Select BCSP as the protocol and select baud appropriately

5) With PSTool you can find the UART settings near the bottom of the list (they are alphabetically listed)
6) Change your settings
7) Select View -> Programmer ID's
8) Change the following settings:
    a. PSKEY_UART_CONFIG to 168
    b. PSKEY_HOST_INTERFACE to vm_access_to_uart (or 4)
    c. PSKEY_VM_DISABLE to False
9) Close PSTool, start Terminal software and Reset the Evaluation Kit

6 TROUBLESHOOTING

6.1 I GET NO RESPONSE FROM THE ASCII COMMAND INTERFACE

Make sure your terminal settings are correct. Use PSTool to check the UART settings from the WRAP THOR Bluetooth module and make similar settings into your terminal software.

6.2 I CAN CONNECT ONLY TO ONE DEVICE

This is a constraint of the current version. Only one connection (point to point) at a time is supported.

7 KNOWN ISSUES

After Service Discovery Protocol (SDP) query WRAP THOR module is no longer connectable and is not seen in inquiries.

8 SUPPORT

Contact BlueGiga Technologies Inc. support at support@bluegiga.com

RECORD OF CHANGES

Date	Version	Notes
13.3.03	1.0	Initial Version
4.4.03	1.01	Updates for AI release 1.1 and new mode change (data->command with <1s>+++<1s>)
3.6.03	1.02	Two new PSTool settings added: VM disable, deep sleep state configuration. Commands updated.
23.6.03	1.03	INQUIRY NAME updated.
3.7.03	1.04	Changing UART configuration